

Offsetting Greenhouse Gas Emissions: Agriculture's Role in the Mississippi Alluvial Valley

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I appreciate the opportunity to be here and participate in these discussions on "Agriculture's Role in Offsetting Greenhouse Gas Emissions." The remarks I have prepared are focused regionally (Slide 1) on the Mississippi Alluvial Valley (MAV). Considering the impact this region has traditionally had on national agricultural policy, I think it appropriate to consider for a moment how agriculture's emerging role in carbon sequestration could affect the MAV and vice versa.

I intend to structure my remarks around three topics (slide 2): 1) how the wildlife community views agriculture's role; 2) how the wildlife community is positioning itself to support that role; and 3) a "context for coordination" between the energy, agriculture, and environmental communities.

How the Wildlife Community Views the Role of Agriculture in the MAV

On a national scale, agriculture's role in offsetting greenhouse gas emissions is focused primarily on carbon sequestration in agricultural soils. I've taken the liberty here of borrowing two slides from Dr. Paustian's presentation last year to make the following point. (Slide 3) The agricultural practices employed throughout much of the 1900's resulted in as much as a 50% decrease in soil carbon over a 50-70 year period. However, as noted by Dr. Paustian in last year's presentation (Slide 4), agricultural production practices of the past 10-20 years have begun to reverse the process of carbon depletion, and by some estimates US agricultural soils are beginning to function as a carbon sink. The potential for further sequestration is high; and not surprisingly, the focus of the agricultural community is on continuing the trend, recognizing that substantial soil and water quality benefits can also accrue. It is appropriate at this point to say that we in the wildlife community agree heartily – carbon friendly agriculture will invariably be water quality friendly. Over the past 10 years (Slide 5), the wildlife community, operating through the North American Waterfowl Management Plan's Lower Mississippi Valley (LMV) Joint Venture has devoted considerable resources promoting waterfowl (and water quality) friendly management practices on production agricultural lands within the MAV. We have provided technical and financial assistance to over 2,000 landowners to seasonally restore and manage wetland hydrology on more than 210,000 acres of harvested croplands. The water quality and soil retention benefits have been well documented, and we expect this management practice to be very carbon friendly.

But, it is appropriate here to digress. Much of agriculture's contribution to greenhouse gas (GHG) emissions has been a function of not simply how we've farmed, but what we've farmed (Slide 6). This is particularly so in the MAV, and herein lies a broader role for agriculture in offsetting GHG emissions. Let me explain.

The history of natural resource development in the MAV is a history of agricultural expansion into "the Nation's floodplain." (Slide 7). In its pre-settlement state, the MAV contained a 22-million acre expanse of sub-tropical/temperate zone forested wetlands. Early expansion was focused on the higher landforms

– braided stream terraces and the natural levees associated with the Mississippi River’s numerous meander belts. At the time of the original National Wetland Inventory in the early 1950’s, agriculture was well established on the higher sites and protected from Mississippi River headwater flooding. The MAV still contained an internationally significant expanse of forested wetlands. More than 9 million acres remained, generally on the more poorly drained portions of the MAV and in areas regularly affected by the headwater flooding of alluvial valley tributaries and/or backwater flooding from the Mississippi River. Over the next 30-35 years, more than 4 million acres of the remaining forested wetlands were converted to agriculture.

In the Mississippi Alluvial Valley, the Nation’s post-war agriculture expansion was less an expansion than an encroachment – a movement of agriculture from the higher, better drained sites into the poorly drained, frequently flooded portions of the MAV. This phenomenon merits a closer look (slide 8), and in doing so let me go back to forest cover of the 1950’s and focus on the middle two-thirds of the MAV where we have new information on the extent of natural flooding. For orientation, let’s compare again the extent of forested wetlands in the 1950’s with that of the early 1990’s (slide 9). That most of this 2 million-acre expansion occurred in increasingly wetter areas is illustrated with this slide (slide 10); where, as you can see, the majority of the clearing occurred on soil associations that were increasingly more hydric in nature.

Let’s now look (slide 11) at natural flood storage basins as discerned from an analysis of satellite imagery of flood events over the past 20 years. By overlaying flood storage basins on 1950’s land cover (slide 12), you can see that prior to the last major agricultural expansion, over 70% of these flood prone areas was still forested. By the early 1990’s less than 40% was forested (slide 13), and most of this was either on the unprotected side of the mainline Mississippi River levees or within the system of state and federal wildlife refuges. Said in other words, the extent of agricultural expansion into the Delta’s remaining flood storage basins has been nearly complete.

From this illustration, you can perhaps see that we in the wildlife community view agriculture’s role in offsetting GHG emissions as being two-fold (slide 14). It includes not only carbon sequestration in agricultural soils; but also carbon sequestration within all terrestrial carbon pools achieved through the reestablishment of forested wetlands on a portion of “the Nation’s floodplain.” The conservation partners of the Lower Mississippi Valley (LMV) Joint Venture have characterized the scope of the opportunity as being the reestablishment of forested wetlands (slide 15) on as much as two to four million acres of the MAV’s most environmentally sensitive land by 2050 as part of a national response to offsetting GHG emissions. Within this role lies an opportunity to address conditions that many observers have long characterized as being neither economically nor environmentally sustainable.

How the Wildlife Community Is Positioning Itself to Support Agriculture’s Role in the MAV (slide 16)

To support this ambitious goal, the partners of the LMV Joint Venture came together only last week to form a “Lower Mississippi Valley Carbon Sequestration Initiative”(slide 17). The Joint Venture itself is a 14-year old partnership of private, state, federal wildlife conservation organizations focused on implementing regional, national, and international bird conservation plans. Through the “LMV Carbon Sequestration Initiative,” Joint Venture partners will be developing an “ecological roadmap” (slide 18) to complement and support the Department of Energy’s “Carbon Sequestration Technology Roadmap.” Our intent is to promote and support within the Mississippi Alluvial Valley and West Gulf Coastal Plain carbon sequestration partnerships that are both ecologically and economically sustainable.

A key element of the roadmap (slide 19) will be science-based decision support models to provide an objective and credible means of targeting forest wetland restoration to the most environmentally sensitive lands. Decision support models are being developed for the three primary categories of wetland restoration benefits: habitat; hydrology; and water quality. A habitat-based decision support model has already been developed for the suite of wildlife species most affected by forest fragmentation, neotropical forest breeding birds (slide 20). This model, originally developed from 1992 land cover data, is currently being updated to account for nearly 400,000 acres of reforestation that has occurred since 1992. It will be augmented with a decision support model built on the biological needs of another area-sensitive species, the Louisiana black bear. The natural flood storage data you saw previously (slide 21) is being refined to provide spatially explicit stage/area data as indicated in this example from central Louisiana (slide 22). A soil moisture index developed by Ducks Unlimited and the Forest Service will be incorporated as a key data layer in a water quality model. Additionally, Joint Venture partners are cooperating in the development of a web-enabled reforestation tracking system to support landscape-level monitoring programs (slide 23).

In this manner, the wildlife community is committed to science-based support of an extensive, long term approach to forest wetland restoration in the Mississippi Alluvial Valley.

A “Context for Coordination” (slide 24)

Clearly, the scope and scale of the issues associated with managing the Nation’s GHG emissions pose an unprecedented conservation challenge to both the agricultural community and the wildlife community. I say “conservation challenge” because the sequestration of carbon in terrestrial ecosystems is at heart a restoration issue – an attempt to restore a degraded ecosystem function. The passage of the 1986 Farm Bill ushered in an era of unprecedented coordination between the agricultural community and the wildlife community. Recognizing that debate continues on how farm policy will ultimately balance commodity supports with conservation incentives, throwing carbon into the mix will add to the complexity, increase the stakes, and underscore the need for even closer cooperation. In the simplest terms, I believe our “context for coordination” should be this (slide 25) – creating programmatic and policy linkages between energy, agriculture, and environment that move us collectively toward more sustainable use of the Nation’s agricultural and forestry land base. Lest I sound too idealistic, let me conclude with a real world example (slide 26).

An environmentally sensitive portion of the MAV strongly affected by agricultural encroachment is a region in central Louisiana known as the Bushley Bayou Area. As you can see (slide 27), the conversion of forested wetlands to high risk agricultural land was extensive. When, in the 1990's, the Wetland Reserve Program brought economically viable alternatives to continued cropping of high risk lands, response was high (slide 28). However, the demand was even higher, and last year a major agricultural landowner sold nearly 19,000 acres (slide 29). The area was purchased in partnership by the Fish and Wildlife Service and American Electric Power (AEP) with assistance from The Conservation Fund. The Service acquired approximately 8,000 acres (to include the residual rights in the WRP tracts). AEP acquired, and has reforested (slide 30), the remaining 11,000 acres for its potential carbon credits. The Service will manage the AEP property under a 25-year management agreement as part of Catahoula NWR, a RAMSAR “Wetland of International Importance.” It also worth noting that this carbon-financed restoration effort will largely obviate the need for a multi-million dollar system of levees and pumps proposed by the Corps of Engineers in the late 1950's in support of the land conversion that was only just beginning. At Bushley Bayou, a linkage has been created between energy, agriculture, and the environment in support of sustainable restoration; and therein lies

the “context for coordination” that I alluded to earlier. (slide 31)

By now I think most everyone is aware of the new directions charted by President Bush last week. The President’s “Clear Skies Initiative” and “Global Climate Change Initiative” will provide new incentives for partnerships between the energy, wildlife, and agricultural communities in support of ecologically sound and economically sustainable approaches to carbon sequestration. Nowhere is the promise greater or the potential higher than in the Lower Mississippi Valley. To that end, we should be guided by a goal commensurate with the challenge. And yet, as we ponder the potential of seeing two to four million acres of forest wetland restoration in the Lower Mississippi Valley, we should be mindful that the goal is not one of returning to another era. It is rather a goal for moving forward in search of an agricultural and forestry land base that will support communities and economies sustainable in the broadest sense.